UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,393	09/08/2000	Kathrin Berkner	074451.P110	3421

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EXAMINER
LEE, TOMMY D

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/658,393	BERKNER ET AL.
	Examiner	Art Unit	
	Thomas D. Lee	2625	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2006*.

2a)☐ This action is **FINAL**.　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,38-47,84-86 and 119-123* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,38-47,84-86 and 119-123* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April

11, 2006 has been entered.

Response to Amendment

2.   This Office action is responsive to applicant's amendment filed April 11, 2006.

Claims 1-9, 38-47, 84-86 and 119-123 are pending.

Claim Rejections - 35 USC § 102

3.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

4.   Claims 84-86 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S.

Patent 5,497,777 (Abdel-Malek et al.).

Regarding claims 84-86, Abdel-Malek et al. disclose a method comprising:

applying a forward wavelet transform to image data (wavelet transform processor 36

(column 4, lines 21-44)); performing denoising by thresholding coefficients generated by

applying the forward wavelet transform (threshold processor 38 (column 5, line 42 –

column 6, line 10)); rescaling coefficients by filtering coefficients after thresholding (part

of inverse wavelet process (column 6, lines 20-42). The method further comprises

sampling the wavelet coefficients (wavelet coefficients are inherently sampled in threshold process); and applying an inverse wavelet transform on filtered coefficients (inverse wavelet transform processor 42 (column 6, lines 10-18)).

Claim Rejections - 35 USC § 103

5.   The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6.   Claims 1, 2, 38-40 and 120-122 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Publication WO 99/28865 (Decegama) in view of U.S. Patent 5,748,786 (Zandi et al.).

Regarding claims 1, 2, 38, 120 and 121, Decegama discloses a system comprising: a wavelet-based image processing path to enhance an input image in a wavelet domain, comprising a forward wavelet transform (multistage wavelet transform filter 50 (page 6, lines 7-23)), one or more wavelet-based processing blocks (enhancement system 10 (page 7, lines 18-22)), and an inverse wavelet transform (multistage inverse transform filter 22 (page 9, line 27 – page 10, line 20)); and a print engine coupled to the processing path (output device 62 may be a printer (page 5, lines 23-27)). The system further comprises an input operable to receive the input image from an external source and a scanner for generating the input image, wherein the input and the scanner are coupled to the image processing path (signal source 68 may be a scanner; input device may be a keyboard 64)).

Decegama does not disclose a unit to sharpen or smooth text and image regions of the image data corresponding to the input image, wherein the image processing path

further includes a classifier, the classifier to control reduction of image noise, smoothing

of the image, and sharpening of the image. Zandi et al. disclose this limitation (column

15, lines 6-27). In view of Zandi et al., one of ordinary skill in the art would have been

motivated to modify the teaching of Decegama by providing a unit for sharpening or

smoothing the image data, because such a unit enhances the detail of the output

image.

Regarding claims 39, 40 and 122, Decegama discloses a method comprising:

processing an input image by enhancing the input image, including applying a forward

wavelet transform to create a plurality of coefficients and filtering coefficients with a

coefficient domain operator in a wavelet domain (multistage wavelet transform filter 50

(page 6, lines 7-23)); and outputting a processed image (output device 62). The

method further comprises: applying one or more wavelet-based processing blocks to

coefficients resulting from applying the forward wavelet transform (enhancement system

10 (page 7, lines 18-22)); and applying an inverse wavelet transform (multistage inverse

wavelet transform filter 22 (page 9, line 27 – page 10, line 20)).

Decegama does not disclose sharpening or smoothing text and image data in the

wavelet domain corresponding to the input image, wherein the processing an input

image further includes applying a classifier to the plurality of coefficients prior to

thresholding. Zandi et al. disclose this limitation (column 15, lines 6-27). In view of

Zandi et al., one of ordinary skill in the art would have been motivated to modify the

teaching of Decegama by providing a unit for sharpening or smoothing the image data,

because such a unit enhances the detail of the output image.

7.   Claims 39, 40, 122 and 123 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Abdel-Malek et al. in view of Zandi et al.

Regarding claims 39, 40, 122 and 123, Abdel-Malek et al. disclose a method

comprising: processing an input image by enhancing the input image, including applying

a forward wavelet transform to create a plurality of coefficients and filtering coefficients

with a coefficient domain operator in a wavelet domain (wavelet transform processor 36

(column 4, lines 21-44)); and outputting a processed image (display system 18 outputs

processed image (column 6, lines 42-49). The method further comprises: applying one

or more wavelet-based processing blocks to coefficients resulting from applying the

forward wavelet transform (threshold processor 38 processing wavelet transform signal

(Fig. 2) to remove noise (column 5, line 42 – column 6, line 10); and applying an inverse

wavelet transform (inverse wavelet processor 42 (column 6, lines 10-18)).

Abdel-Malek et al. do not disclose sharpening or smoothing text and image data

in the wavelet domain corresponding to the input image, wherein the processing an

input image further includes applying a classifier to the plurality of coefficients prior to

thresholding or denoising. As mentioned above, Zandi et al. disclose this limitation

(column 15, lines 6-27). In view of Zandi et al., one of ordinary skill in the art would

have been motivated to modify the teaching of Abdel-Malik et al. by providing a unit for

sharpening or smoothing the image data, because such a unit enhances the detail of

the output image.

8.   Claim 119 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Patent 5,905,579 (Katayama et al.) in view of Zandi et al.

Katayama et al. disclose a copier having a wavelet-based image processing path for enhancing image data (wavelet transforming circuit 2, edge detecting circuit 3, character detecting circuit 4 (column 3, lines 29-47); for use in a copier (column 1, lines 11-18)).

Katayama et al. do not disclose one or more units to sharpen or smooth text and image regions of the image data corresponding to the image data. As mentioned above, Zandi et al. disclose this limitation (column 15, lines 6-27). In view of Zandi et al., one of ordinary skill in the art would have been motivated to modify the teaching of Katayama et al. by providing a unit for sharpening or smoothing the image data, because such a unit enhances the detail of the output image.

9.   Claims 3 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decegama in view of Zandi et al. and U.S. Patent 5,412,741 (Shapiro).

Neither Decegama nor Zandi et al. explicitly disclose a critically sampled wavelet transform. This type of wavelet transform is well known in the art, as noted by Shapiro (column 1, lines 34-38). Applicant has not disclosed that the use of a critically sampled wavelet transform provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well using any one of a number of well-known wavelet transform processes depending on the image data to be reduced, including the critically sampled wavelet transform, because all wavelet transforms effectively reduce the amount of image data for storage or transmission. Therefore, it would have been

obvious for one of ordinary skill in the art to apply a critically sampled wavelet transform

to the combined teaching of Decegama and Zandi et al.

10.   Claims 4, 5, 42 and 43 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Decegama in view of Zandi et al. and U.S. Patent 6,236,745 (Chen et

al.).

Neither Decegama nor Zandi et al. explicitly disclose an overcomplete or Haar

wavelet transform. This type of wavelet transform is well known in the art, as noted by

Chen et al. (column 3, lines 48-58). Applicant has not disclosed that the use of an

overcomplete or Haar wavelet transform provides an advantage, is used for a particular

purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would

have expected applicant's invention to perform equally well using any one of a number

of well-known wavelet transform processes depending on the image to be reduced,

including the overcomplete or Haar transform, because all wavelet transforms

effectively reduce the amount of image data for storage or transmission. Therefore, it

would have been obvious for one of ordinary skill in the art to apply an overcomplete or

Haar wavelet transform to the combined teaching of Decegama and Zandi et al.

11.   Claims 6, 7, 44 and 45 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Decegama in view of Zandi et al. and U.S. Patent 6,148,111

(Creusere).

Neither Decegama nor Zandi et al. explicitly disclose a 5,3 or 2,6 wavelet

transform. This type of wavelet transform is well known in the art, as noted by Creusere

(column 5, line 64 - column 6, line 1). Applicant has not disclosed that the use of a 5,3

or 2,6 wavelet transform provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well using any one of a number of well-known wavelet transform processes depending on the image data to be reduced, including the 5,3 or 2,6 wavelet transform, because all wavelet transforms effectively reduce the amount of image data for storage or transmission. Therefore, it would have been obvious for one of ordinary skill in the art to apply a 5,3 or 2,6 wavelet transform to the combined teaching of Decegama and Zandi et al.

12.   Claims 8 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decegama in view of Zandi et al. and U.S. Patent 6,847,737 (Kouri et al.).

Neither Decegama nor Zandi et al. explicitly disclose a complex wavelet transform. This type of wavelet transform is well known in the art, as noted by Kouri et al. (column 32, lines 65- 67). Applicant has not disclosed that the use of a complex wavelet transform provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well using any one of a number of well-known wavelet transform processes depending on the image data to be reduced, including the complex wavelet transform, because all wavelet transforms effectively reduce the amount of image data for storage or transmission. Therefore, it would have been obvious for one of ordinary skill in the art to apply a complex wavelet transform to the combined teaching of Decegama and Zandi et al.

13.   Claims 9 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Decegama in view of Zandi et al. and U.S. Patent 6,141,452 (Muran).

Neither Decegama nor Zandi et al. explicitly disclose a limited redundancy

wavelet transform. This type of wavelet transform is well known in the art, as noted by

Muran (column 3, lines 49-56). Applicant has not disclosed that the use of a limited

redundancy wavelet transform provides an advantage, is used for a particular purpose

or solves a stated problem. One of ordinary skill in the art, furthermore, would have

expected applicant's invention to perform equally well using any one of a number of

well-known wavelet transform processes depending on the image data to be reduced,

including the limited redundancy wavelet transform, because all wavelet transforms

effectively reduce the amount of image data for storage or transmission. Therefore, it

would have been obvious for one of ordinary skill in the art to apply a limited

redundancy wavelet transform to the combined teaching of Decegama and Zandi et al.

Response to Arguments

14.   Applicant's arguments filed in response to the prior rejection of the above claims

under 35 U.S.C. 102(b) and 103(a) as set forth in the Prior Office action have been fully

considered but they are not persuasive.

In response to the prior rejection of claims 84-86 under 35 U.S.C. 102(b) as

being anticipated by Abdel-Malek, applicant asserts that Abdel-Malek fails to describe or

suggest "rescaling coefficients by filtering coefficients after thresholding." Applicant

states that Abdel-Malek merely reconstructs an ultra-sound image through the use of

the simple inverse of the discrete wavelet transform to decompose an image, but fails to

describe or suggest further processing image coefficient data after the threshold

processor and before the inverse wavelet transformation, or the use of a filter in the

rescaling of wavelet coefficients (see current amendment, pages 7-8). However, as set

forth in the Office action mailed December 9, 2005 (see *Response to Arguments*, on

page 2), rescaling, as disclosed in applicant's specification, at page 23, lines 12-13,

corresponds to multiplication of coefficients by a multiplication factor. In Abdel-Malek,

each coefficient is multiplied by a multiplication factor (column 6, lines 25-35), thereby

proving a rescaling of the coefficients.

In response to the prior rejection of claims 1, 2, 38-40, 120 and 121 under 35

U.S.C. 103(a) as being obvious under Decegama in view of Zandi, applicant asserts

that Decegama describes processing wavelet coefficients classified as local maxima

and minima to enhance edge regions, and that Zandi only describes providing wavelet

coefficients to an enhancement system without further describing the system or

performing processing in the wavelet domain. Thus, applicant asserts that neither

Decegama nor Zandi, alone or in combination, describe or suggest "a wavelet-based

image processing path to enhance an input image in a wavelet domain, wherein the

processing path includes a unit to sharpen or smooth text and image regions of the

image data corresponding to the input image." (see current amendment, at pages 8-10).

Contrary to applicant's assertion, Zandi discloses sharpening or smoothing of text and

image regions of image data. At column 15, lines 23-25, Zandi states that

"[s]harpening, edge enhancements, noise control, etc. may be performed using a

hierarchical decomposition."

In response to the prior rejection of the remaining claims, applicant asserts the none of the cited prior art disclose the above sharpening or smoothing of text and image regions of the image data (see current amendment, at pages 10-14). As noted above, this limitation is disclosed in Zandi.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (571) 272-7436. The examiner can normally be reached on Monday-Friday, 7:30-5:00, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (571) 272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas D Lee
Primary Examiner
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tdl
April 28, 2006